

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application.

1. (Currently Amended) A current supply circuit providing an output current corresponding to digital data of n bits (wherein n is an integer not less than 2), comprising:

a current driving device;

a current output node electrically connected to a first power supply node via said current driving device ~~during~~ while current is being supplied by said current supply circuit;

a current control circuit ~~provided~~ connected between a second power supply node and said current output node ~~and~~, receiving digital data, corresponding to the digital data, for controlling the current flowing in a current path, ~~including that~~ includes said current output node, and extends between the first and second power supply nodes ~~during the~~, while current is being supplied by said current supply circuit; and

a voltage regulating circuit receiving the digital data for forcing, after the current ~~supply~~ supplying starts, a change in voltage on said current output node, based on the digital data, said voltage regulating circuit including

a plurality of internal nodes corresponding to respective bits of the digital data,

a plurality of voltage sources corresponding to respective internal nodes,
each voltage source independently supplying a respective voltage,

a plurality of first switch elements respectively connected between
respective voltage sources and internal nodes,

a plurality of capacitors connected to respective internal nodes, and
a plurality of second switch elements connected between said current
output node and respective internal nodes, wherein each of said second switch
elements turns on or off depending upon a corresponding bit of the digital data while
current is being supplied by said current supply circuit.

2. (Currently Amended) The current supply circuit according to claim 1, wherein said current driving device includes a field effect transistor having a source and a drain electrically connected to ~~the said~~ first power supply node and said current output node, respectively, and a gate, and the gate and drain of said field effect transistor are electrically connected ~~during the~~ to each other while current is being supplied by said current supply circuit.

3. (Currently Amended) The current supply circuit according to claim 1, wherein,
~~during the~~ while current is being supplied by said current supply circuit, the voltage on said current output node settles to a steady voltage corresponding to a level of the output current, depending on characteristics of said current driving device, and said voltage regulating circuit exchanges ~~electric~~ electrical charge with said current output node to move the voltage on said current output node closer to the steady voltage ~~depending on~~ corresponding to the digital data.

Claims 4-6 (Cancelled).

7. (Currently Amended) The current supply circuit according to claim 1, wherein

said current control circuit includes n constant-current supplies respectively corresponding to the ~~respective~~ n bits of the digital data and connected in parallel to said current output node, and

said n constant-current supplies generate, respectively corresponding to the n ~~respective~~ bits, first to n -th currents between the second power supply node and said current output node.

8. (Previously Presented) The current supply circuit according to claim 7, wherein the first to n -th currents are set in gradations in a power of 2 corresponding to a predetermined weighting of the n bits of the digital data.

Claims 9 and 10 (Cancelled).

11. (Currently Amended) A display device producing a gray-scale display corresponding to image data of n bits (wherein n is an integer not less than 2), comprising:

a current supply circuit for supplying a display current corresponding to the image data;

a plurality of pixel circuits, each pixel circuit including a current-driven light-emitting device providing a brightness corresponding to a supplied current and a pixel driving circuit for supplying said current-driven light-emitting device with a current corresponding to the display current; and

a current data line for conveying the display current, ~~which is provided~~ supplied by said current supply circuit, to said plurality of pixel circuits, wherein

said pixel driving circuit has a current driving device connected between said current data line and a first power supply node during a ~~predetermined~~ period in which the display current is conveyed ~~thereto~~ to said pixel driving circuit, and ~~supplies~~

supplying said current-driven light-emitting device with ~~a~~ the current corresponding to the display current ~~conveyed~~ during the ~~predetermined~~ period, and

said current supply circuit includes:

a current control circuit ~~provided~~ connected between a second power supply node and said current data line ~~and~~, receiving the image data ~~for~~, and controlling, ~~corresponding to~~ in correspondence with the image data, the current flowing in a current path, ~~including that includes~~ said current data line, and extends between said first and second power supply nodes ~~during supply of~~, while the display current is being supplied by said display current supply circuit; and

a voltage regulating circuit receiving ~~said~~ the image data for forcing, after ~~supply~~ supplying of ~~said~~ the display current starts, a change in voltage on said current data line, based on ~~said~~ the image data, said voltage regulating circuit including

a plurality of internal nodes corresponding to respective bits of the image data,

a plurality of voltage sources corresponding to respective internal nodes, each voltage source independently supplying a respective voltage,

a plurality of first switch elements respectively connected between respective voltage sources and internal nodes,

a plurality of capacitors connected to respective internal nodes, and

a plurality of second switch elements connected between said current output node and respective internal nodes, wherein

each of said first switch elements turns on prior to supplying of the display current and turns off while the display current is being supplied, and

each of said second switch elements turns off in a period during which each of said first switch elements is turned on, and turns on or off

depending on a corresponding bit of the image data while the display current is being supplied.

12. (Currently Amended) The display device according to claim 11, wherein said current control circuit includes n constant-current supplies respectively corresponding to the ~~n-respective~~ bits of the image data and connected in parallel to said current data line, and
said n constant-current supplies generate first to n-th currents on said current data line based on the ~~n-respective~~ bits.

Claims 13 and 14 (Cancelled).

15. (New) The current supply circuit according to claim 1, wherein
each of said first switch elements turns on prior to a supply period supplying the output current, and
each of said second switch elements turns off in a period during which each of said first switch elements turns on.

16. (New) The current supply circuit according to claim 1, wherein said plurality of capacitors, said plurality of internal nodes, said plurality of voltage sources, said plurality of first switch elements, and said plurality of second switch elements are n capacitors, n internal nodes, n voltages sources, n first switch elements, and n second switch elements, respectively, corresponding to n bits of the digital data.

17. (New) The current supply circuit according to claim 16, wherein,
while current is being supplied by said current supply circuit, the voltage on said current output node settles to a constant voltage corresponding to a level of the output current, depending on characteristics of said current driving device, and

the first to n -th voltages respectively supplied from said n voltage sources and capacitances of said n capacitors are designed, for each of at least one of the combinations of the n bits of the digital data, based on conservation of charge, to produce reflects a constant voltage before and after at least one of said n switching devices, corresponding to one of the n bits, is turned on.